Digital Modular Radio
AN/USC-61(V)

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Abstract

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13. ABSTRACT *(Maximum 200 Words)*

This briefing takes a look at the DMR mission and how DMR works. It also looks at the legacy equipment that is capable of being replaced by DMR.

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Outline

- ❑ **DMR Mission**

- ❑ **Why DMR?**

- ❑ **What is DMR?**

- ❑ **Program Status**

- ❑ **Developmental Testing**

- ❑ **Procurement Plan**

- ❑ **Fielding**

- ❑ **Conclusions**

MOTOROLA

⚓DMR

DMR Mission

"Acquire an Affordable, High-Capacity, Capable Tactical Radio to Provide Interoperable LOS/BLOS C4I Capabilities to the Fleet"

- ◆ **Built to Open Systems Architecture**

- ◆ **Maximizes COTS/NDI**

- ◆ **Able to Evolve As Commercial Technology Advances**

- ◆ **Not Tied to Original Manufacturer for Updates**

- ◆ **Supports Future Proofing**

- ◆ **Interoperable, Affordable, Scaleable, Flexible!**

Why DMR?

- ❑ **Plethora of <u>Narrowband</u> <u>Stovepipe</u> Radios are now 20+ years old—represents 60's, 70's technology that:**
  - ◆ **require extensive manpower to maintain & operate,**
    - ● **difficult to find obsolete, replacement parts.**
    - ● **limited or non-existent production base.**
  - ◆ **are a drain on limited fleet resources,**
  - ◆ **have limited capability, singular functionality, no automation & incapable of growth.**

System	IOC
AN/WSC-5	1972
AN/WSC-3	1976
AN/URT-23	1960s
AN/URC-109	1989
R-1051	1960s
R-2368	1980s
VRC-46	1960s

HF
- AN/URT-23 HF Transmitter
- AN/URT-24 HF Transmitter
- R-1051/URR Receiver
- SRA-49 Receive Multicoupler
- SRA-56/7/8 Multicoupler
- URA-38 RF Control & Coupling System
- R-2368 HF Receiver
- URC-131 HF Transmit Group
- AS-2537 Antenna
- AS-3772 Antenna
- OE-404V Antenna System
- OE-418 Antenna System
- AS-3771 Antenna
- IHFA Wire Antenna System
- OE-()V/SRC Antenna
- OA-9243 Tilt Whip Antenna System

VHF
- VRC-46 Transceiver
- GRT-21 VHF Transmitter
- GRR-23 VHF Receiver
- GRC-211 VHF Trans
- AN/URC-80 VHF Trans
- AN/URC-139 Bridge to Bridge
- TD-1456 Multicoupler
- TD-1289 Multicoupler
- SRC-54B
- AS-3226 Antenna
- AS-2809 Antenna
- NT-66095 Antenna
- AS-4293 Antenna
- AN/VRC-49 Transceiver
- AN/URC-94 Transceiver
- GRC-171 Transceiver
- SRA-60

**HF, VHF, UHF Radios and Ancillary Equipment
Too Many Stovepipe Radios in Service Today!**

What is DMR?
Software Programmable Digital Radio

Information Superiority Requires New Capabilities

Today
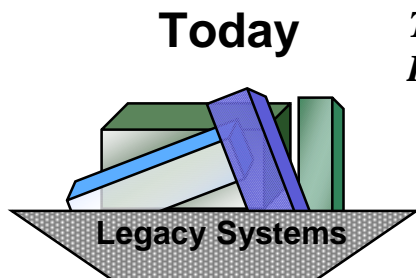
Transmit, Receive, Bridge, and Gateway Between Similar and Diverse Waveforms Over Multiple Communications Media and Networks

Legacy Systems
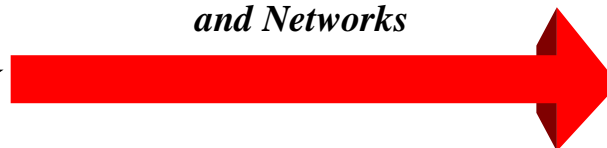
Software Programmable Digital Radio

- **Single Frequency**
- **Single Waveform**
- **Not Capable of Simultaneous Voice, Data, Video**
- **Low to Medium Data Rates**
- **Limited Routing, Networking, Network Management**
- **Can Not Automatically Adjust Performance**
- **Not Capable of Simultaneous Operation With Other Systems in Same or Other Domains**
- **Lacks Adequate Frequency Flexibility to Operate Globally**

- **Multi-band, Multi-mode, Secure, Non-secure (Voice, Video & Data)**
- **Operate across a wide frequency range (e.g. 2 MHz to 2 GHz)**
- **Dynamic Bandwidth Management**
- **Retransmit/Cross Band Between Frequency Bands and Waveforms**
- **Software Reprogrammable**
- **Network Between & Across Geographical & Organizational Boundaries**
- **Backwards Compatible With Legacy Systems**

Legacy Equipment Capable of Being Replaced by DMR

UHF

- ◆ AN/WSC-3
  - HAVEQUICK II
  - UHF SATCOM
  - UHF LOS
- ◆ AN/WSC-5
  - Shore UHF SATCOM
- ◆ TD-1271
  - 25 KHz DAMA Modem
- ◆ AN/USC-54 (VICS)
  - UHF SATCOM
  - 25 KHz DAMA
- ◆ AN/USC-42(V)1,2 (MINIDAMA)
  - 5/25 KHz SATCOM
  - UHF SATCOM
  - UHF LOS
- ◆ AN/URC-93
  - LINK 11
- ◆ MD-1324
  - 5/25 KHz DAMA Modem

VHF

- ◆ AN/GRC-211
  - AM/FM Voice
- ◆ AN/VRC-46
  - AM/FM Voice
- ◆ AN/SRC-54
  - SINCGARS
  - SINCGARS SIP

HF (planned for future)
(Receivers & Exciters only)

- ◆ AN/URT-23
- ◆ AN/URC-109
- ◆ AN/URC-131 (HFSST)
- ◆ R-2368/URR
- ◆ R-1051/URR
- ◆ AN/FRT-96

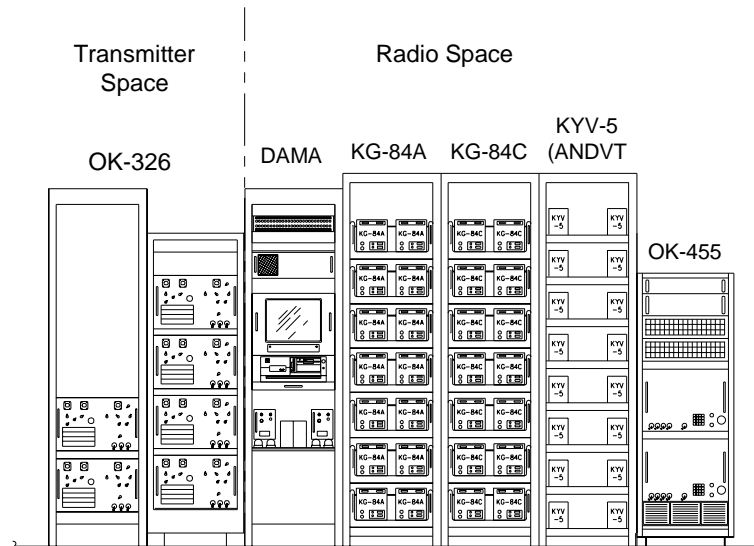| Baseline	Options
ship, shore, sub	30-400 MHz 200W PA
0.1-2000 MHz, 4 Chs	HF 110A/ALE
5/25 kHz UHF SATCOM DAMA	MDR UHF SATCOM
AM/FM/HQII UHF LOS	HDR LOS (up to 4.6 Mbps)
SINCGARS, VHF LOS	SINCGARS SIP
Emedded TRANSEC/COMSEC	SATURN
Open System Architecture	Emedded Link 4A, Link 11
Software (re)Programmable	

DMR Size Comparison
With Existing Systems

Dual DAMA

DDG

Transmitter Space

Radio Space

OK-326

DAMA KG-84A KG-84C KYV-5 (ANDVT

OK-455

54 Boxes/Components, Single Function Radios, Multi-plexers and Cryptos (2194 lbs)

Mini-DAMA

DDG

Transmitter Space

Radio Space

AM-7543 Power Amplifier MINI- DAMA KG-84A KG-84C KYV-5 ANDVT
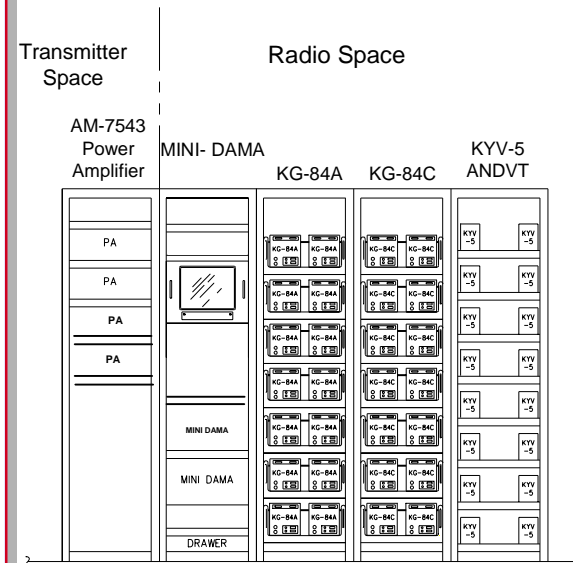
46 Single Band, Single Function Radios and Cryptos (1744 lbs)

DMR
w/ Embedded TRANSEC/COMSEC

DDG

Transmitter Space   Radio Space
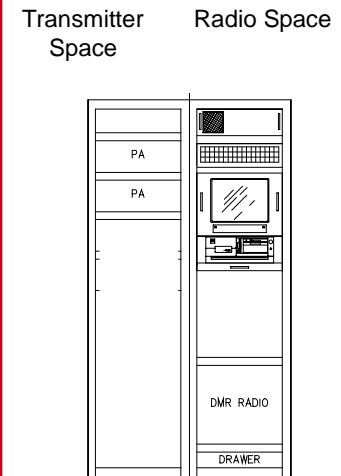
1 Multi-Band, Multi-Function Radio (550 lbs)

Where We've Been

- ❑ **Awarded 2 FFP/IDIQ Contracts—Sep '98 to Raytheon & Motorola**
  - ◆ **Architecture for UHF SATCOM, UHF LOS, MIL-188-181/182/183, SINCGARS which:**
    - ● **ensures compliance with performance specs from JTRS ORD/ Maritime\Fixed Annex,**
    - ● **offers options for other advanced capabilities.**

- ❑ **Conducted Extensive 8-Week Test on Initial Units**
  - ◆ <u>**No Clear Technical Winner**</u> **- both products showed weaknesses**
  - ◆ **Vendors afforded additional time to improve products**

- ❑ **Conducted Final Round of Testing—Ended Dec '99.**
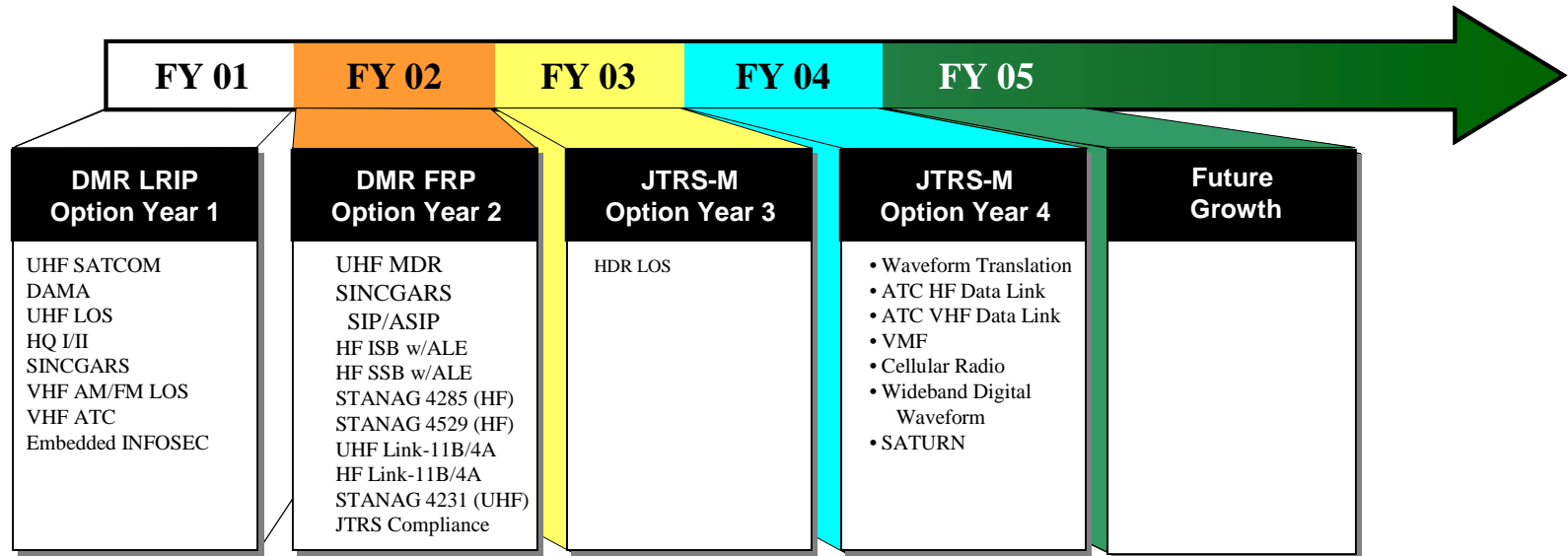 - ◆ **Winning vendor: Motorola - announced 2 Feb '00.**

Where We're At

- ❑ **Delivery of First LRIP Unit expected Nov '00**
  - ◆ **Version 2.0 hardware currently being produced by Motorola.**
  - ◆ **Balance of the LRIP 1 Units will be delivered to Version 3.0 configuration during May/Jun '01.**

- ❑ **Testing Required Prior to LRIP 2 Award**
  - ◆ **Additional testing on Version 2.0 H/W to determine progress on identified deficiencies.**

- ❑ **OPEVAL**
  - ◆ **Scheduled Jun '01.**
  - ◆ **Install and Check-out of Motorola's S/W ver. 5.1, begins Jan '01.**

- ❑ **INFOSEC Certification**
  - ◆ **Working with NSA to further define the evaluation criteria for the NSA certification process and to pin specific "HARD" requirements.**

Where We're Going

FY 01	FY 02	FY 03	FY 04	FY 05

DMR LRIP Option Year 1	DMR FRP Option Year 2	JTRS-M Option Year 3	JTRS-M Option Year 4	Future Growth

UHF SATCOM
DAMA
UHF LOS
HQ I/II
SINCGARS
VHF AM/FM LOS
VHF ATC
Embedded INFOSEC
	UHF MDR
	SINCGARS
	  SIP/ASIP
	HF ISB w/ALE
	HF SSB w/ALE
	STANAG 4285 (HF)
	STANAG 4529 (HF)
	UHF Link-11B/4A
	HF Link-11B/4A
	STANAG 4231 (UHF)
	JTRS Compliance
		HDR LOS	• Waveform Translation
			• ATC HF Data Link
			• ATC VHF Data Link
			• VMF
			• Cellular Radio
			• Wideband Digital
			  Waveform
			• SATURN	

❑ **<u>Purpose:</u> Determine if DMR is ready to enter Operational Test and Evaluation (OPEVAL)**

❑ **Objectives:**

◆ **Evaluate DMR performance, effectiveness, and suitability.**

◆ **Verify DMR interoperability with UHF SATCOM legacy systems.**

◆ **Assess UHF Line-of-Sight (LOS) capabilities.**

◆ **Exercise designated shipboard operators & maintainers**

DT-IIE
Test Approach

Exercise DMR in a manner identical to the way COMOPTEVFOR will test. . .

- ◆ **Conduct TECHEVAL on Not-to-Interfere basis with normal shipboard operations.**

- ◆ **Record data as it occurs during ship's normal course of operations.**

- ◆ **Measure End-to-End performance using UHF SATCOM networks.**

- ◆ **Confirm compliance With JTRS ORD Annex B Maritime/Fixed:**
  - ● **record data and voice statistics**
  - ● **test to a 97% confidence level**

- ◆ **Verify Integrated Logistics Support (ILS):**
  - ● **validate ILS certification**
  - ● **review documentation (i.e., Technical Manuals, etc.)**
  - ● **Assess training**

DMR Procurement Plan

Platforms	FY99 Lrip One	FY00 LRIP TWO	FY01	FY02	FY03	FY04	FY05	FY06	FY07
OPN-DMR	15	26	0	22	49	9	2	7	13
OPN-JIMINI	59	12	0	16	8	0	2	0	0
HF-DMR		62			15	31	6	31	23
LPD 17-18		18							
CVN 69/76		4							
LPD 19-20			18						
DDG 93-95			21						
DDG 96-98				21					
LPD 21-22					18				
DDG 99-101				21					
LPD 23-24						18			
DDG 102-103					14				
LPD 25-26						18			
CVN 70					14				
LHD 8					12				
Total	**74**	**122**	**39**	**80**	**130**	**76**	**10**	**38**	**36**

SATCOM Fielding

❑ **Methodology:**

◆ **No units will be fielded until <u>Milestone III.</u>**

◆ **Installation priorities IAW IT-21 implementation matrix.**

◆ **Planned ship class DMR quantities:**

SHIP CLASS	DMRs REQUIRED	SHIP CLASS	DMRs Required
CVN	3	DD	2
CV	3	FFG	1
AGF	3	MCS	3
LCC	3	MCM	1
LHA	3	MHC	1
LHD	3	AOE	1
LPD	2	AO	1
LSD	2	ARS	1
CG	2	AS	1

Conclusions

❑ **DMR – state-of-the-art system that will revolutionize RF communications in the fleet. . .**

   ◆ **Consolidated capability**

   ◆ **Automated**

   ◆ **Flexible**

   ◆ **Smaller**

   ◆ **More powerful**

   ◆ **Software Upgradeable**

❑ **Progressive acquisition strategy will provide "Best Value" product.**

❑ **The revolution that DMR/JTRS brings the user, will serve as the cornerstone in the overall <u>radio room automation</u> vision of PMW179.**

❑ **Need feedback from the user to best help us help you.**

❑ **Need you (user) to help us win support for greater expansion of DMR and future DMR capabilities with Navy leadership.**

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